UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,279	11/01/2001	Andrew J. Edwards	50037.56US01	2114

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EXAMINER
KENDALL, CHUCK O

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

<table>
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10/001,279</td><td>Applicant(s)
EDWARDS ET AL.</td></tr>
<tr><td>Examiner
Chuck Kendall</td><td>Art Unit
2192</td></tr>
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 October 2004</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>03/11/2003</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the application filed 10/28/04.

2.   Claims 1 – 20 have are pending.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claim 1 – 5 & 8 – 20 are rejected under 35 U.S.C. 102(b) as being anticipated by

Maebayashi et al. USPN 5,450,589.

Regarding claim 1, Maebayashi anticipates a computer-implemented method for

dynamically modifying an executing heterogeneous program in a distributed computing

environment, the method comprising:

obtaining a system reference to a target system on which the heterogeneous

program is executing (2:63 – 67, for reference see address also see Fig 2, 17, 18, 26,

and 25, which shows Host, terminal and data processing system addresses and version

information is contained in the databases 18 and 30, the terminal is equivalent to target

reference),

obtaining a program reference to the heterogeneous program based on the

system reference (2:65 – 3:5, see working program and holding unit for program

reference);

locating a component of the heterogeneous program based on the program

reference, the component residing in a target system memory associated with

the target system (2:65, see " an address of each data to be modified...");

creating a modified executable code based on an internal representation

of the component derived from an original executable code associated with the

component (3:15 – 25, see renews); and

inserting the modified executable code into the target system memory (2:37 –

42).

Regarding claim 2, the computer-implemented method of Claim 1, wherein the

modified executable code comprises a user mode code that executes in user mode.

Regarding claim 3, the computer-implemented method of Claim 2, wherein

inserting the Modified executable code comprises:

suspending one or more threads from processing on the target system (8: 45 -

53);

. if the modified executable code consumes more memory than the original

executable code, injecting the modified executable code into the target system memory

at a new memory location (18: 25 – 40);

else, patching the modified executable code into the target system memory by

overwriting an original memory area with the modified executable code, the original

executable code being resident in the original memory area (6:25 – 50); and

resuming the one or more threads for processing on the target system (8: 49 –

53, see restarting);

Regarding claim 4, the computer-implemented method of Claim 3, further
comprising fixing a first thread out of the one or more threads if the first thread was
suspended while executing a portion of the original executable code in the original
memory area (3: 20 – 25, for fixing see modified).

Regarding claim 5, Maebayashi discloses all the claimed limitations as applied in
claim 3 above as well as copying original executable code Maebayashi which Examiner
interprets to be Maebayashi's limitation of storing a plurality of versions of code
including the original versions (older) in a data store 2: 55 – 60, and pending on if it
operates correctly being able to change the version to an older one see 11: 5 –10;

locating the new memory location for the modified executable code (2:63 –67);

writing the modified executable code to the target memory at the new memory
location (FIG.1, parts 6, 9 & 11);

redirecting execution of the heterogenous component to the modified executable
code (4:38 – 40, see transfer command issuing unit, and modification data transfer
path).

Regarding claim 8, the computer-implemented method of Claim 7, wherein
inserting the modified executable code comprises:

replacing a first portion of the original executable code that resides in a
first part of the original memory area with an instruction that disallows a thread from
executing instructions in a second part of the original memory area (3: 5 –15, for
disallow see abnormal stop unit);

replacing the second part of the original memory area with a portion of the

modified executable code (3:16 –18); and

replacing the instruction in the first part of the original memory area with

another portion of the modified executable code, in manner such that the original

memory area contains the modified executable code (3: 20 –25).

Regarding claim 9, the computer-implemented method of claim 1, further

comprising determining whether the target system is a remote system, and if the target

system is a remote system (15: 37 – 45), initiating a dynamic instrumentation process

on the target system the enables communication with a tool residing on a local system

that is performing the dynamic modifications to the heterogeneous program (1: 60 – 65,

for dynamic instrumentation see, firmware modification comprising a processor

executing a program).

Regarding claim 10, the computer-implemented method of claim 1, wherein the

internal representation is derived from the original executable code that resides in the

target system memory (2: 5 – 10).

Regarding claim 11, the computer-implemented method of Claim 1, wherein the

internal representation is derived from the original executable code that resides on a

local storage device (2: 7 – 10, see modification data storing unit).

Regarding claim 12, the computer-implemented method of claim 1, wherein the

modified executable code comprises a procedure (for procedure, see Fig. 5).

Regarding claim 13, the computer-implemented method of claim 1, wherein the

modified executable code comprises a basic block (2: 57 – 62, see blocks).

Regarding claim 14, the computer-implemented method of Claim 1, wherein the modified executable code comprises an instruction (Fig. 5, 104, see modification command).

Regarding claim 15, Maebayashi anticipates a computerized system comprising:

a processing unit (Fig. 1, 2);

a system memory coupled to the processing unit through a system bus (Fig. 3. see bus handlers, 33);

a computer-readable medium coupled to the processing unit through a system bus (Fig. 4, 54, see EEPROM);

a hierarchical intermediate representation for a heterogeneous program residing in the system memory (Fig. 15, see firmware for intermediate representation, i.e., low level language);

a transformation process executing in the processing unit for modifying the hierarchical intermediate representation to create a modified intermediate representation associated with the heterogeneous program (Fig. 16c, items 513 –515);

a dynamic modification process executing in the processing unit for modifying an executable code in a target system memory based on the modified intermediate representation, the executable code being associated with the heterogeneous program (Fig. 16c, see rewrite in item 514).

Regarding claim 16, which recites the system version of claim 3, see rationale as previously discussed above.

Regarding claim 17, which recites the system version of claim 5, see rationale as

previously discussed above.

Regarding claim 18, which recites the system version of claim 8, see rationale as

previously discussed above.

Regarding clam 19, the computer system of Claim 15, wherein the target system

is a remote system (15: 37 – 45).

Regarding claim 20, which recites the computer readable medium version of

claim 15, see rationale as previously discussed above.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Maebayashi et al. USPN 5,450,589 as applied in claim 5, in view of Hammond USPN

6,463,583 B1.

Regarding claim 6, Maebayashi discloses all the claimed limitations as applied in

claim 5 above. Although, Maebayashi doesn't explicitly disclose wherein redirecting

execution includes writing a jump instruction in a first address of the original memory

area, the jump instruction including an offset to the new memory location, he does

mention a modification data transfer path 13, in 4:37 – 40, which is linked to the

Modification holding unit which stores a plurality of versions of instructions as seen in

FIG. 1. Hammond in an analogous art does disclose inserting a jump command in the

original in 3: 5 – 25,

> " A jump command is inserted from the injection dynamic link library within the
>
> main dynamic link library function in the kernel dynamic link library to create a
>
> modified kernel dynamic link library in memory...The original kernel dynamic link
>
> library is replaced in memory with the modified kernel.dynamic link library on the
>
> windowed operating system".

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to combine, Maebayashi and Hammond because, using

jump a instruction or pointer to redirect or reference the update program would enable

the system to more dynamically locate the modified instructions.

Regarding claim 7, Hammond further discloses the computer-implemented

method of Claim 1, wherein the modified executable code comprises a kernel mode

code that executes in kernel mode (Hammond, 3: 55 – 60).

Response to Arguments

7.   Applicant's arguments filed 10/28/2004 have been fully considered but they are

not persuasive.

Argument (1), Applicant argues on page 8 of response as dated above, that the

primary cited reference Maebayashi, does not teach "dynamically modifying and

executing heterogenous program.

Examiner disagrees. In Mabayashi on column 1, lines 55 – 65, teaches utilizing

a working program holding unit to modify a program while a processor is executing even

while located in a remote place (distributed environment), also refer to Fig. 5, 14b – 14c.

Argument (2), Applicant also argues that Maebayashi doesn't teach, " obtaining a

system reference to a target system on which the heterogeneous program is executing".

Response (2), Examiner believes that Maebayashi does in fact teach this.

Maebayashi in Fig. 2 shows various system components which communicate with a

terminal (target) and also shows a communications protocol between the Host computer

and the target system, i.e., terminal including databases which house the version

numbers and address information associated therewith, also see 5: 35 – 55, for further

discussion in Maebayashi regarding reference to target system or terminal.

Argument (3), Applicant also further argues that Maebayashi doesn't teach

"locating a component on the heterogeneous program based on the program

reference".

Response (3), Examiner disagrees. In column 5, lines 52 - 65, Maebayashi

shows being able to control and transmit information from the host computer to the

customers computer, and this would require being able to locate the customer node.

Argument (4), Applicant also argues that Maebayashi doesn't show "creating a

modified executable code ...".

Response (4), Contrary to Applicant's argument Maebayashi again shows, as

discussed in previous rejection on column 3, lines 15 – 25, program data which from

the holding area which is modified with the modification data (creating modified code).

The holding area which is previously discussed above in Response (1), is the area that holds the executing program which is being modified. And hence teaches creating the modified executable code.

Regarding Applicant's argument on page 11 that there is no suggestion to combine Maebayashi and Hammond. Examiner disagrees. Maebayashi discloses a transfer command issuing unit which transfers the command (jump) to the holding area to process the modification data (2:25 – 35). Examiner believes this suggests and is very similar and analogous to redirection.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
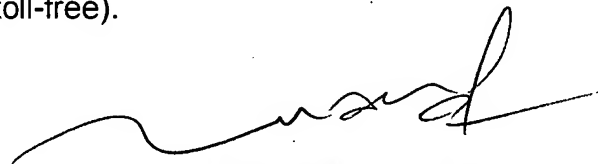
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Kendall whose telephone number is 571-272-3698. The examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Ck.

TUAN DAM
SUPERVISORY PATENT EXAMINER